Watershed Initiative for the Assabet River (WIAR)

Presented by: Briana Diacopoulos, Sandra Petrakis, Dan Warner, and Jessica Wong.

Mission statement

To conserve water resources, to enhance water quality, and to improve ecological health and function within the Assabet Watershed by addressing current issues impacting three major tributaries (Hop Brook, Elizabeth Brook, and Nashoba Brook) and providing recommendations to implement by 2036.

Watershed Characteristics

Watershed Area: 177 mi^2

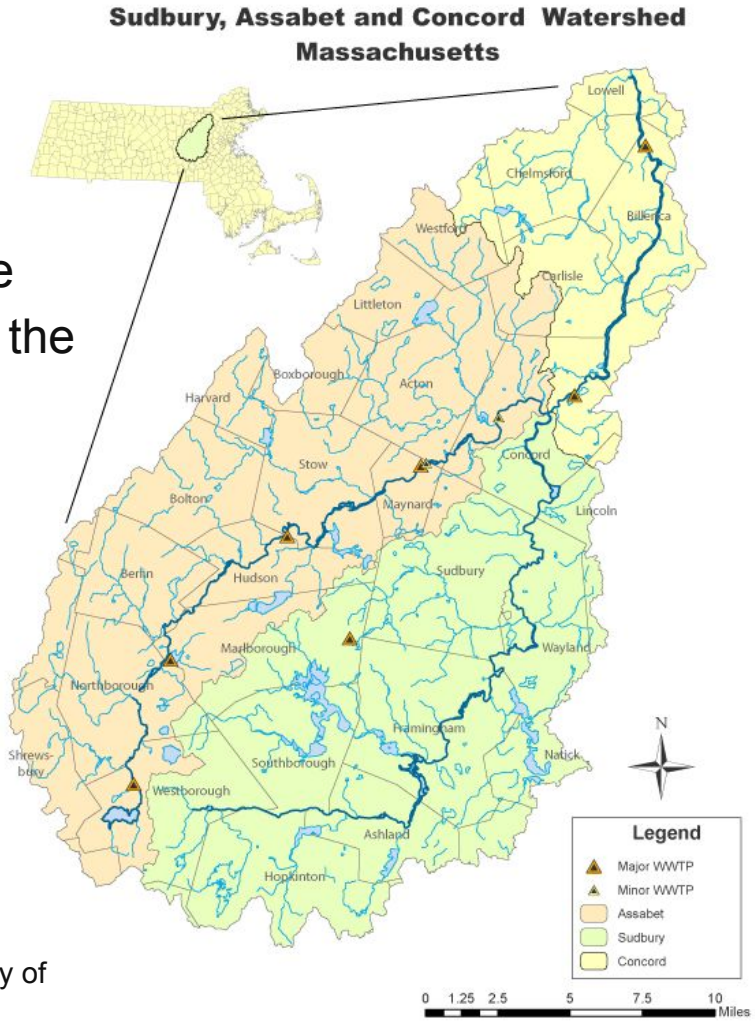
River Length: 31 miles (dropping 320 feet) from the headwaters until it meets the Sudbury River to form the Concord River.

Major Tributaries: Hop Brook, Elizabeth Brook, Nashoba Brook

Geology: Glaciation during the Pleistocene epoch.

Watershed Population: >170,000

Municipalities: 19 towns and one city; including 9 towns along the mainstem (Westborough, Northborough, Berlin, City of Marlborough, Hudson, Stow, Maynard, Acton, Concord).



HISTORY

The name “Assabet” comes through the filter of time from the (spoken) Algonquin word for “the place where materials for making fish nets comes from.”

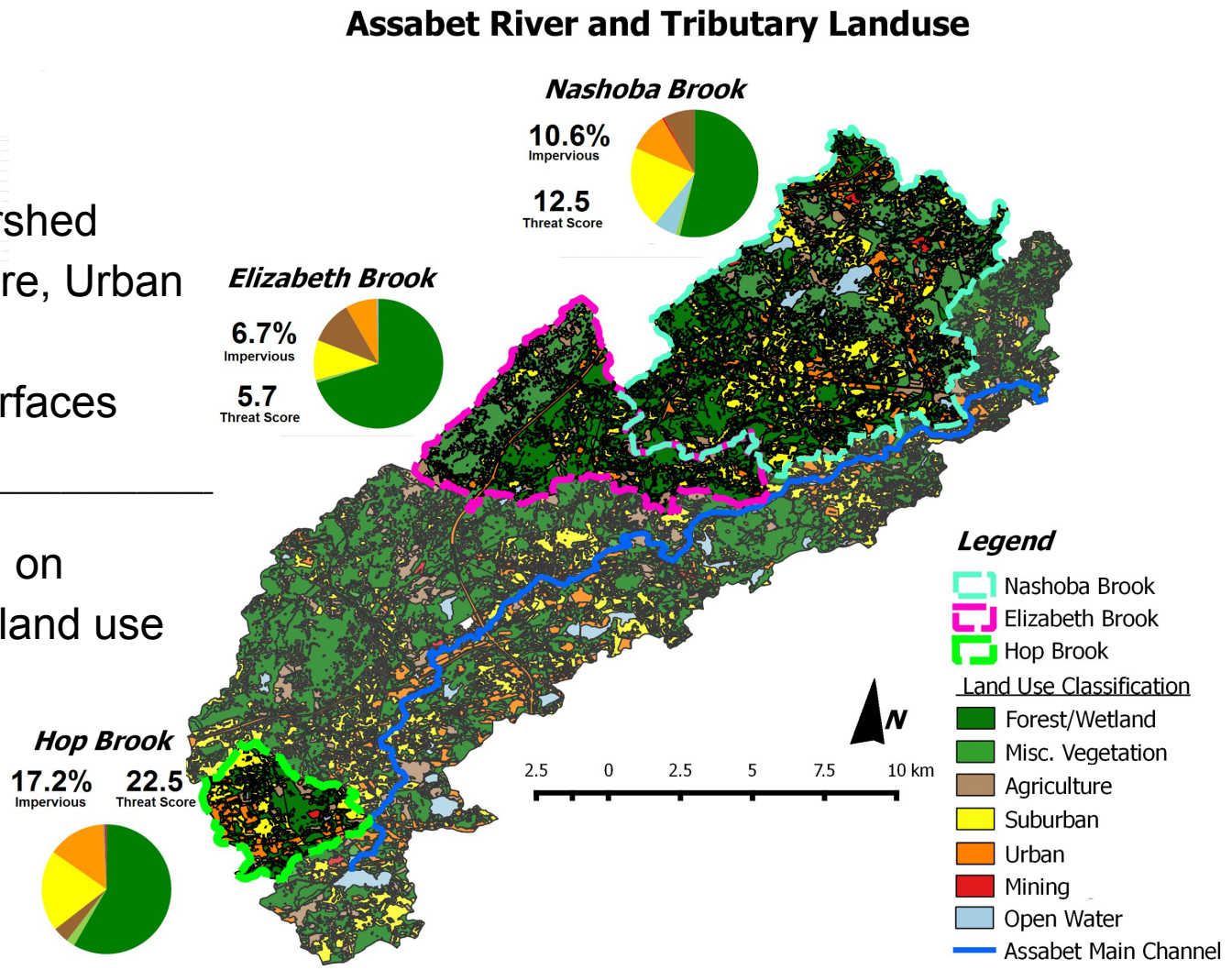
“Wamesit” and “Pawtucket” were the two tribes inhabiting the area along the Assabet and lower Concord River before European settlers arrived.

During the 1800’s, Nathaniel Hawthorne, Henry David Thoreau, Ralph Waldo Emerson, and Louisa May Alcott all lived on or near the Assabet and/or Concord Rivers and were often inspired by them in their writing.

LANDUSE

- Mixed land use watershed
  - Mining, Agriculture, Urban Areas
- 11.5% Impervious surfaces

- “Threat Score” based on impervious area and land use categories
- Threat Score: 12.4



Dams

- **Historical hydropower source and economic asset**
- **Many dams built in 1800s**
- **Aging dams build up nutrient-rich sediments and act as perpetual sources of pollution**
- **Removal costly with major short-term impacts**

The Dam Problem

There are many man-made dams along the Assabet River network. These dams act as major sources of N- and P- laden sediments that can significantly impact water quality and ecosystem health. However, removal of many of these dams may damage property and put human lives at risk (high hazard). Thus, remediation efforts should focus first on low hazard dams to reduce costs and risks to human interests

Other Pollution Challenges

- Municipal wastewater plants discharge high BOD, N, and P
- Fertilizer runoff from agriculture and residential land use
- Water table drawdown by excessive water usage
    - Increases nutrient concentrations, decreases velocity and oxygen levels
- Hypereutrophic impoundments as result

Polluted Major Tributaries

Hop Brook: Municipal wastewater treatment discharges and urban runoff

- Consistent violations for low dissolved oxygen, high N and P

Elizabeth Brook: Surface runoff and old dams

- Occasional violations for low dissolved oxygen, high P

Nashoba Brook: Wastewater treatment plant discharge, runoff, excessive water usage, and old dams

- Excess nutrients, impacted dissolved oxygen, and low flow in summer months

WATER USAGE

Surface Water

- Recreation: Canoeing, fishing, parks, and bike tours, etc.

Groundwater

- Public-water supplies approximately 80% of the basin population
- 74% of water withdrawal is from GW for public, industrial, agricultural, and recreational use
- Nearly half of GW withdrawal is discharged to the Assabet River after treatment (3.6 Mgal/d)

Wastewater

- Wastewater is returned to the groundwater-flow system through on-site septic systems (3.5 Mgal/d).
- Low flows contribute to eutrophication and failure to meet QW standards.

Problems and Solutions

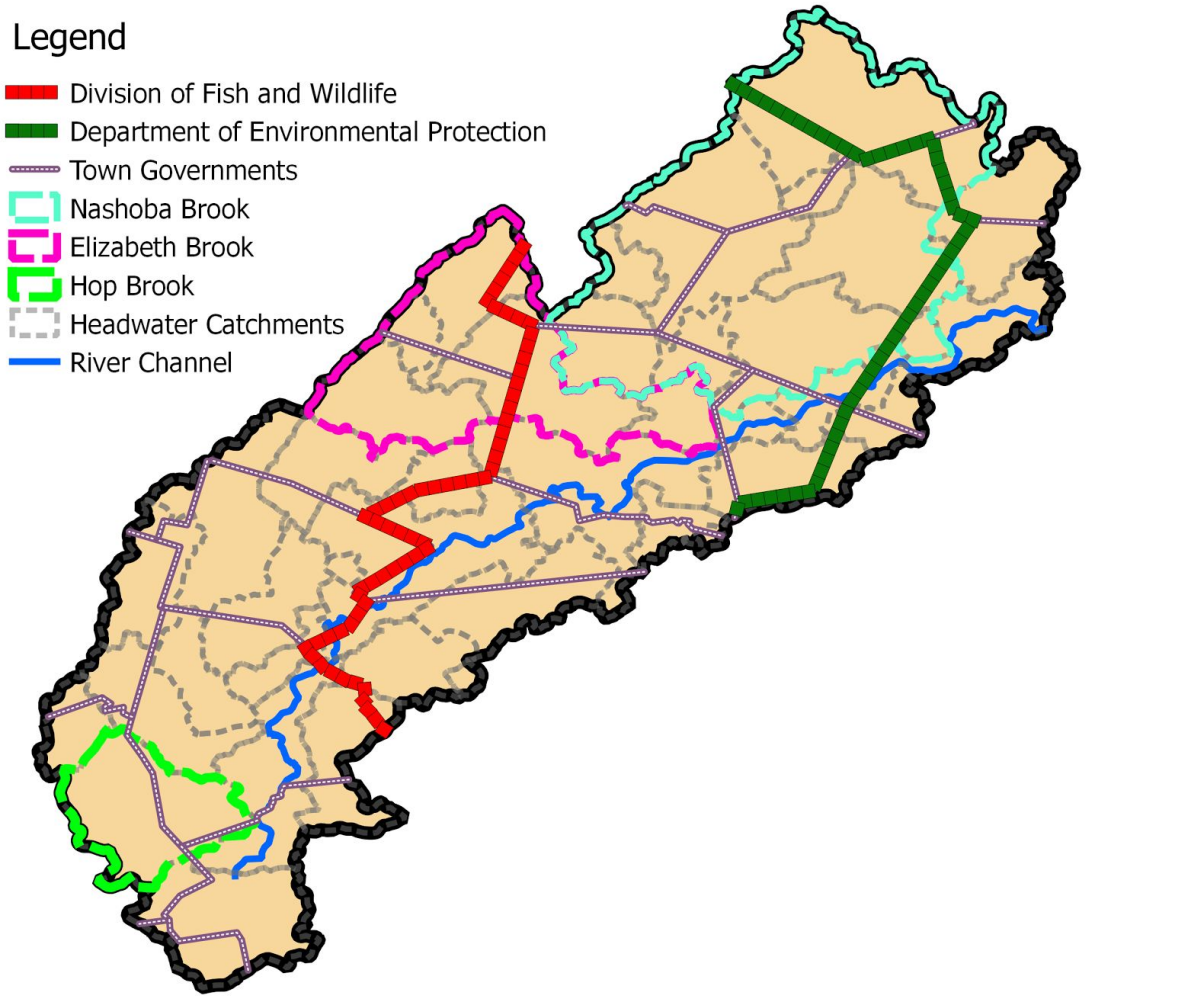
Issue	Causes	Strategies
Excessive Nutrients	1. WWTP utilities 2. Dams/Impoundments 3. Lawn and Agriculture Fertilization	1. New technology to reduce P 2. Careful dam removal 3. Public outreach and education
Sediment Pollution	1. Dams/Impoundments	1. Careful dam removal
Water Table Drawdown	1. Residential and Commercial Water Overuse	1. Public outreach and education 2. Stricter regulations

Policy Challenges

- Several overlapping jurisdictions in the Assabet River Watershed
  - **2** MA DEP Regions
  - **2** MA Dept. Fish and Wildlife Regions
  - **2** Congressional Districts
  - **2** Counties
  - **19** Municipalities

- **<u>Where will the money come from?</u>**

Overlapping Jurisdictions in the Assabet River Watershed



Citations and credits

http://www.oars3rivers.org/

http://suasco.org/

http://www.mass.gov/anf/research-and-tech/it-serv-and-support/application-serv/office-of-geographic-information-massgis/

http://www.mass.gov/eea/agencies/massdep/water/

http://www.nae.usace.army.mil/Missions/ProjectsTopics/AssabetRiverStudy.aspx